

**AMENDMENTS TO THE CLAIMS**

This listing of claims will replace all prior versions and listings of claims in the application:

**LISTING OF CLAIMS:**

1. (currently amended): A device for detecting an abnormality of a rotating body characterized in that the improvement comprises:

means for measuring various physical quantities a signal correlated with vibration or sound of the rotating body in rotation;

means for extracting a signal which is synchronized with the rotation cycle of rotating body by the data measured by the measuring means;

means for determining a condition of the rotating body from the signal extracted by the extracting means; and

abnormality warning means for giving warning of abnormality when the determining means determine that the condition of the rotating body is abnormal;

wherein the extracting means comprise an adaptive digital filter which extracts a signal synchronized with the rotation cycle and picks out a signal having no correlation with the rotation cycle by means of a data measured by the measuring means and a signal synchronized with the rotation cycle extracted by the extracting means, and adapts the adaptive digital filter by means of the signal picked out and having no correlation with the rotation cycle.

2. (canceled).

3. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein a delayed data of the data measured by the measuring means is used in extracting a signal synchronized with the rotation cycle in the extracting means.

4. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein the data delay time corresponds to one rotation time of the rotating body.

5. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein a delay circuit to delay the data is provided on a signal line between an input portion of data from the measuring means and an adaptive digital filter.

6. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 3, wherein a delay circuit to delay the data is provided on a signal line between an input portion of data from the measuring means and a comparator to extract a signal having no correlation with the rotation cycle.

7. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein an order component generated by calculating a

rotating cycle from data of rotating information among the data measured by the measuring means is used in extracting a signal synchronized with the rotation cycle in the extracting means.

8. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 7, wherein an order component generation circuit to generate the order component is provided on a signal line between an input portion of rotation information data from the measuring means and an adaptive digital filter.

9. (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 1, wherein the data measured by the measuring means is sampled by a variable sampling in accordance with the data of rotating speed information of the data measured by the measuring means so as to make an apparent cycle constant in extracting a signal synchronized with the rotation cycle in the extracting means.

10 (Previously Presented): The device for detecting an abnormality of a rotating body as claimed in claim 9, wherein a variable sampling circuit to perform a variable sampling is provided on the input portion of data from the measuring means.

11. (currently amended): A method for detecting an abnormality of a rotating body, comprising:  
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| measuring various physical quantities a signal correlated with vibration or sound  
| of the rotating body in rotation;

extracting a signal which is synchronized with the rotation cycle of rotating body by the data measured in the measuring step;

determining a condition of the rotating body from the signal extracted in the extracting step; and

giving warning of abnormality when it is determined that the condition of the rotating body is abnormal;

wherein in the extracting step, an adaptive digital filter extracts a signal synchronized with the rotation cycle and picks out a signal having no correlation with the cycle by means of the data measured in the measuring step and a signal synchronized with the rotation cycle extracted in the extracting step, and the adaptive digital filter is adapted by means of the signal picked out and having no correlation with the cycle.

12. (Previously Presented): The device as claimed in claim 1, wherein the signal extracted by the extracting means has a cycle that is equal to the rotation cycle of the rotating body.

13. (Previously Presented): The method as claimed in claim 11, wherein the extracting step includes extracting a signal having a cycle that is equal to the rotation cycle of the rotating body.